1 *Introduction*

1.1 Introduction

The use of technology in education has always been somewhat controversial. This may seem like an unusual statement to make at the start of a book that deals with the use of mobile technologies in teaching and learning contexts, but pointing this observation out from the outset helps to frame several of the relevant issues pertaining to the acceptance – and resistance – of technology, including its position in discussions of theoretical, empirical, and practical issues surrounding its use. Although technology has featured more prominently in education than could have possibly been imagined since the spread of the COVID-19 virus at the beginning of 2020, there still remain strongly divided opinions as to its long-term use as a viable option to quality education rather than a stopgap until the world recovers from the disaster. The controversy surrounding technology usage in education is caused by a complex net of interrelated factors that are difficult to explain in isolation of one another, and yet in some ways have shaped the way that technology has come to be viewed in the larger educational context. This includes, to some degree, how it has been viewed as an academic discipline. Attitudes towards technology have ranged from enthusiastic or overly optimistic at one end of the spectrum to critical or doubtful at the other, and these attitudes have both given rise to and resulted from the controversies surrounding technology use in education. Looking at these controversies and the reasons behind them may lead to a more balanced view of technology – including, of course, mobile technologies – in language teaching and learning to form a more solid foundation on which to understand the concepts and contexts, and to see how best to anticipate and deal with the potential challenges.

Among the many controversies, perhaps the most obvious has centred around *pedagogical* aspects. Since the beginning of the field

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of computer-assisted language learning (CALL), discussions about the effects of learning through technological versus non-technological means have held prominence. Some practitioners have embraced new technologies as they appear, while others have been more hesitant to accept them. For some, technology is viewed as an integral part of keeping up with the times (Hanna, Brown, Dede, Olcott, Poley, Schmidt & Tallman, 2000; O'Flaherty & Phillips, 2015), where it is seen as an indispensable tool that provides significant benefits for teaching and learning. For others, however, such technologies are little more than a gimmick, something that can be used to perk student interest for a time but with little or no added real educational value, or even detracting from valuable class time (Reid, 2014; Rogers-Estable, 2014). Depending on the ways in which technology is used, however, both of these perspectives may actually be correct. Technology most certainly does have the potential to add elements to a teaching and learning environment that can enhance learning, but at the same time, if technology is simply used for the sake of the technology itself without careful planning and implementation, then the benefits for learning can be so greatly diminished that non-use can be a more effective option.

A second controversy is related to *socioeconomic* aspects. The digital divide (i.e., the disparity that exists between those with access to technologies and those without) has been a topic of discussion since the 1990s. Widespread access to information and communications technologies (ICT) was seen as being closely linked to socioeconomic development, and the setting up of infrastructure to allow stable and affordable Internet connections has been an ongoing challenge. Mobile devices such as mobile phones and tablets have been seen as potentially having an equalising effect, where mobile broadband has made Internet access more available to users in less affluent regions such as in Africa (Gillwald, 2017) and South America (Galperin, 2016). At the same time, however, debates have also taken place surrounding the dangers of accentuating the digital divide, where users around the world are spending considerably more money on communications than is stipulated in the statistics set out by the Broadband Commission for Digital Development (2015, cited in Gillwald, 2017). Although the digital divide has most widely been discussed at a national or regional level, the discrepancy is also relevant at an institutional or even an individual level. Institutionally, such divisions can result in a type of technological eliteness, where institutions that can afford expensive technologies are somehow seen as providing better services than those that with less advanced resources. It is not difficult to see how this links to pedagogical concerns, with many institutions

feeling real or perceived pressure to provide similar levels of technological resource infrastructure in order to provide an image of a better learning experience for learners (O'Callaghan, Neumann, Jones & Creed, 2017). While it would be difficult to draw a direct link to confirm whether wider access to technologies will necessarily result in better learning outcomes, it is also difficult to argue that there is *no* relationship either, and having greater access to technology does seem to provide greater opportunities for learning if it is used appropriately. That is to say, if learners have access to technology, there is at least the chance for learning to take place, but this is based heavily on how the technology is used. It is individually, however, that we may see the greatest impact of mobile learning with regard to the digital divide. Requiring learners to use their own mobile devices for education can impart burdens upon those in less advantaged socioeconomic circumstances than their peers, which can cause stress and/or embarrassment to them, feelings of inferiority, and potentially even detrimental impacts on motivation to engage in learning through their mobile devices at all.

Thirdly, there is *academic* controversy, one that somehow views CALL as a lesser field to the broader parent fields of second-language acquisition and information technology. CALL has often been branded as lacking in theoretical foundation and academic rigour, and while there may have been some evidence of this in the early days of CALL research, there is also an extremely solid foundation of well-conceived and well-conducted research that has made a significant contribution to our understanding of other fields as well. A seminal article by Coleman (2005) drew attention to this issue, indicating that CALL has often lacked the "mutual respect" (p. 20) of other fields, evidenced by publications in CALL journals citing research from respected SLA journals but very little evidence of the reverse. More than a decade after this observation, the trend still seems to stand largely true, as seen by the lack of references to CALL-related journals in articles that have a similar focus but do not use technology. Technology can provide relevant data on language teaching and learning and insights that are made possible only through the adoption of technology (Blake, 2000). Despite the fact that disseminating research in CALL journals has become increasingly competitive and publishing in high-ranking journals in the field is now considered extremely difficult, the image clearly persists of CALL research as being somehow less rigorous than other, more "established" fields (Leakey, 2011), and it is difficult to predict when or if it will be put on a similar standing with research in SLA or other educational fields.

Finally, technologies have been a part of *administrative* controversy, where pressures have been placed on teachers – and ultimately learners – to use new technologies, frequently with little explanation or support provided, and input in the selection of technological resources is often not sought from the teachers who will actually be expected to use them. The underlying reasons for technology adoption by administrators are, no doubt, complex and have ranged from actual or anticipated cost-cutting, promotion of institutional image, and betterment of the teaching and learning environment, although the real benefits in each of these regards have been somewhat questionable (Bowen, Chingos, Lack & Nygren, 2014; McPherson & Bacow, 2015). There have been, of course, multiple unanticipated outcomes from the introduction of technology by administration, some of which are more positive and others more negative. Positively, aside from the benefits associated with support for learning itself through technology, in some ways, it has made the exchange of information among administrators, teachers, and learners more transparent, where the channels of communication are somewhat more open than in the past. Negatively, the relative ease with which technology makes collecting and analysing data also means that teachers may be subjected to more frequent centrally administered online evaluations. While evaluations in themselves may not necessarily be problematic, they do have the potential to place greater pressure on teachers to strive towards higher evaluation scores (Lejonberg, Elstad & Christophersen, 2018), which may or may not be an accurate picture of better teaching. Moreover, evaluations may even contribute to less willingness to experiment or to be innovative in order to avoid potential failures (e.g., Bennett, Dawson, Bearman, Molloy & Boud, 2017; Carless, 2009).

The cost issue has always been a contentious one, and attempts to use technology to save money inevitably result in shifts towards other expenses such as maintenance of the technologies and hiring sufficient support staff to ensure that these technologies run smoothly (Reid, 2014). The quality of education that is provided by technologies designed to replace the teacher has consistently drawn debate from many stakeholders – administrators, teachers, students, and even parents – with claims by many commercial providers that their products are comparable with human teachers that are difficult to substantiate in actual practice. Apart from the oversimplification of the role of the teacher as little more than a provider of content and feedback, claiming that technology can completely replace human teachers largely ignores the myriad human interactions that are an integral part of learning in virtually all aspects of life. This argument itself brings us

back to the pedagogical controversy, which in turn clearly illustrates the interrelatedness of the various factors at play regarding technology in education.

Early CALL practitioners lamented the lack of appropriate teaching materials, software, and trained staff, likening these problems to those of the language laboratories which preceded them (Higgins & Johns, 1984). Indeed, the lessons that were to be learned from language laboratories were still painfully evident in much of the literature written at the time about using computers in language learning. Claims from CALL research also closely paralleled these concerns, and researchers were often in one of two camps: on the one hand, a lack of computers where learners competed with one another to use the limited machines available to them (Fitzgerald, Hattie & Hughes, 1985), and on the other, an over-prevalence of computers which remain underused due to insufficient skilled teachers and the paucity of appropriate teaching resources (Cuban, 2002; Dunkel, 1987). In recent years, we have an abundance of materials and technologies – particularly with most learners having their own devices – but a lack of infrastructure to ensure that these are used properly, meaning that these materials are often not being used in a time- and cost-effective manner.

These examples are far from exhaustive, but they do serve to give us some insights into the controversies that are involved in the adoption and integration of technology in language teaching and learning, of which technology itself is just one factor, and possibly even the factor which is most easily controlled. With the wider use of mobile devices such as mobile phones, smartphones, and wearable technologies appearing in language teaching and learning, these controversies still exist in many shapes and forms. Pedagogical factors remain central, with some believing that mobile learning is the answer to problems that occurred beforehand. This is a concern that was expressed by Bax (2003) about virtually any new technology in language teaching contexts, well before mobile learning started to enter the mainstream (see Stockwell & Reinders, 2019, for a discussion). Mobile learning has long attracted the interest of teachers and administrators, but pedagogy has generally lagged behind the prospects of what it might become. Even now, we see people who are considering using mobile learning ask what app to use, devoid of any contextual information. This question shows a lack of appreciation for the complexity of the field and is akin to asking what language textbook should be used without specifying the skills to be targeted, the level of the students, or the relationship with other elements of a course of study. MALL – like CALL – really does seem bound in expectations that it will make

teaching and learning easier, provided the appropriate app, software, or website can be located. Of course, this view is not universal, but from my experiences with talking about MALL around the world, this very is indicative of the type of questions that I am frequently asked.

From the Field: The Digital Divide

I recall that several years ago, all of the students in one of my classes had smartphones, apart from one. I was not aware of this initially, as all students had responded that they owned smartphones in an informal survey about the technologies that they owned in the first class of the semester. I asked students to try to use materials that they could access through their mobile phones in class, but this one student declined, looking only at his textbook. After class, he came to me and said that he did not have a smartphone as it was too expensive for him to afford the initial contract cost and the monthly charges, and he only owned a GSM phone so that he could keep in contact with their parents as necessary. I assured him that the materials functioned quite well on GSM phones, but the student said that he felt embarrassed to be seen using his older phone in front of the other students. Eventually, he did engage in a small proportion of the activities on his mobile phone, but I learned a valuable lesson as a teacher that day about the dangers of making assumptions regarding the technologies that our learners possess and their feelings about feeling inferior because they can't afford the technologies owned by their peers.

1.2 The Nature of MALL

The spread of mobile devices has taken place at an enormous rate, with contracts for Internet connections through mobile phones surpassing those of desktop computers from as early 2012 (see Pegrum, 2014, for a detailed overview). Mobile devices have become an everyday part of the lives of many people in their social, work, consumerist, and entertainment agendas (Castells, Fernández-Ardèvol, Qiu & Sey, 2007), to the extent that many people – particularly young adults – would find it difficult to survive without them (Burnell & Kuther, 2016). Mobile devices have in many ways become an extension of our bodies. We carry mobile devices – now most commonly smartphones, but also tablets or even wearable technologies – with us at nearly every waking moment (and as an increasingly common problem and to the detriment of the quality of our sleep, many people have them near their bedside even while sleeping). The fact that they are almost always close at hand is obviously one point that has made them

a target for educators, but if we are to consider how they might be used effectively in learning contexts, we also need to think about what it is about these mobile technologies that makes them such a central part of our everyday lives. Carr (2011) suggests that technologies may be roughly divided up into four main categories: (1) an extension of our physical strength, dexterity, or resilience; (2) an extension of the range or sensitivity of our senses; (3) a way of enabling us to reshape nature to better serve our needs or desires; and (4) a way to extend or support our mental powers. Mobile devices may take on any one of these roles in some way, but the most obvious links to language learning would be their ability to extend the range of our senses (such as enabling us to communicate with others at a distance) and extending or supporting our mental powers (through acting as a notebook, a camera, a dictionary, or a search engine, to name but a few). This ready access enables learners to "exploit small amounts of time and space for learning" (Traxler, 2007, p. 8), but exploiting these times and spaces requires learners to make learning a part of their everyday schedule, where they can take advantage of times that may previously have been wasted. In other words, if learners carry their mobile devices with them to both learning and non-learning locations, they will have greater opportunity for engaging in learning activities, if only they decide to make the most of them.

The portability of mobile devices makes possible another potential benefit helping to contextualise learning – that is, to make learning relevant to the specific situations that learners find themselves on a day-to-day basis (Stockwell, 2014). In other words, the attractiveness of mobile learning is that it not only allows learners to spend more time engaging in learning tasks, but also that these tasks can be made to relate to actual experiences to make them more meaningful to each individual learner. Having access to mobile devices that can provide information means that unexpected or unplanned learning situations, such as needing to explain something in the target language to someone on the street, can be taken advantage of by seeking and immediately using this information in authentic contexts. In addition to portability, mobile devices also allow improved opportunities for communication. The fact that mobile devices are typically associated with various social activities of users throughout the day also makes them attractive to attempt to exploit this social element of learning (see Ushioda, 2011). Furthermore, the flexibility and multimodal and non-linear possibilities of mobile devices make them ideal for learners to adjust them to their own particular learning times, spaces, preferences, and goals (Kress & Pachler, 2007). In all, mobile devices, theoretically at the very least, seem to be an ideal tool in which to make language

learning more accessible and relevant to learners. However, the problem is that this has also led to expectations that have often preceded actual empirical outcomes.

This brings us to ask what mobile-assisted language learning really is, how it is perceived, and what these expectations that are held about it actually are. Pegrum (2019) proposes that the "mobile" part of mobile learning may relate not only to mobile devices but also to mobile learners and mobile learning experiences. Although the general perception of mobile learning is typically bound to the use of mobile devices, those devices can, of course, be linked to the mobility of learners and their experiences (mobility is discussed in more detail in Chapter 9). Thus, in the context of this book, MALL refers to learning a second or foreign language[1] through the use of one or more of various mobile devices including, but not restricted to, mobile phones (including smartphones), tablets, personal digital assistants (PDAs), MP3/MP4 players, electronic dictionaries, and gaming consoles. The definition of what is actually included in the list of mobile devices has been surprisingly difficult to determine. Some have contended that the list might include laptop computers (Kukulska-Hulme & Shield, 2008), while others have argued against this (van't Hoof & Vahey, 2007). On this issue, Puentedura's description (cited in Pegrum, 2014) provides a useful distinction between *mobile* and *portable* devices, where portable devices are typically used at Point A, closed down, and then used again at Point B, whereas mobile devices can be used at Point A, Point B, and anywhere in between if so desired.

A commonly held view of MALL by laypersons is that it refers exclusively to the use of these mobile devices in "outside" locations when the user is in transit or, using the previous example, when learners are at somewhere between Point A and Point B. This is, of course, a common use of mobile devices, but research has shown that many learners opt to use them at home, even when other technologies are available (e.g., Stockwell & Liu, 2015). MALL can also be used to refer to the use of these devices inside the classroom, where learners use mobile devices to carry out certain learning tasks or activities. These devices may be provided by the teacher for the duration of the task or activity, or learners may use their own devices – such as using their own phones, tablets, other similar devices. Thus, I would argue that learning through mobile devices does not necessarily need to refer

[1] It could be argued that MALL, like CALL, could also include learning of the first language, but this type of inclusion in extremely rare in the literature. For this reason, MALL has been limited to the learning of a second language in both second and foreign language contexts only in this book.

to learning on the move, and that using mobile devices such as smartphones or tablets at home is still very much a part of mobile learning in that the users feel the devices they are using are a part of their toolkit of resources that they may choose from for learning. The distinction between the mobility or portability of devices may end up being a moot point. We are starting to see a merge between different devices that were once considered to be separate entities, such as laptops and tablets, where the functionalities are overlapping. Laptops are exhibiting the features that were once associated with tablets, for example a touchscreen; and tablets and even smartphones are becoming used more widely for functions that might have been in the realm of laptop and desktop computers – such as word processing, creating spreadsheets, or other office-related uses.

Defining specific devices for mobile learning is becoming increasingly more difficult. Emerging wearable technologies, most notably watches and other devices like Google Glass™, would also be classified as mobile devices, and although there is only a limited amount of research on wearable technologies for language learning at the time of writing (de la Guía, Lopez Camacho, Orozco-Barbosa, Brea Luján, Penichet & Lozano Pérez, 2016), the potential is certainly evident (Bower & Sturman, 2015; Sykes, 2018). These devices typically require an interface with another mobile device such as a smartphone or tablet (although there are some devices that can operate with an independent Internet connection), so the correlation with or dependence on other technologies would need to remain in the consideration of the factors in their use. Furthermore, implanted technologies would be considered as mobile in that they must naturally be carried inside the body with the user at all times, but at this stage, research is limited to assistive technologies such as for people suffering from hearing disorders (e.g., Beeres-Scheenstra, Ohnsorg, Candreia, Heinzmann, Castellanos, De Min & Linder, 2017). These are areas where mobile learning is likely to continue to develop in the future, and they are discussed in more depth in Chapter 9.

The ways in which mobile devices are selected and used will vary considerably depending on the functionality and availability of technology – as well as the experiences, skills, goals, attitudes, and preferences of the multiple participants in the individual context such as the teachers, learners, and administrators. This is obviously an enormous issue, and it takes up a large portion of this book, but specific examples of designing for MALL are included in Chapter 8. As already described, one of the goals of MALL activities is to take learning outside of the classroom and into reality, where learners can not only take advantage of those gaps in time and space but also take

their learning into the world; other goals of MALL activities include personalising learning for 'learners' own needs (Kukulska-Hulme, 2016); interacting with the environment using wireless, GPS, or QR code functions (e.g., Chen, Liu and Hwang, 2015); providing information suited to specific situations through context awareness (e.g., Santos, Saneiro, Boticario and Rodriguez-Sanchez (2016); and expanding upon computer-based activities to keep content fresh in learners' minds (e.g., Sharples, 2014). At the same time, MALL also strives to enrich activities inside the classroom. Learners can have access to learning resources (de la Fuente, 2014) and authentic materials (Ducate & Lomicka, 2013), or teachers can augment existing paper-based materials by providing links to multimedia that can enable a more interactive experience (Solak & Cakır, 2015), to name a few of the potential in-class uses. While these are just a sample of the types of activities that might be included in MALL, it is evident that MALL should encompass more than just delivering simplified and somewhat colourless content and activities on mobile devices as a substitute for computer- or paper-based versions (Squire, 2009). MALL can be highly dynamic, creative, and personalised if carefully planned and implemented, and it is this potential that should drive educators to explore how they can use it in their teaching and learning environments.

Needless to say, mobile learning does not mean that learning must be limited only to the device which is being used to engage in tasks or activities. The mobile devices may be used in conjunction with other non-mobile devices, and also with more traditional non-technological means, such as paper-based resources and materials. This can be seen through mobile devices being used to augment reality (see Godwin-Jones, 2016), such as enabling learners to interact with materials or even places around them, even with limited technological skills. This can even be achieved through using mobile resources that act as a supplement to paper-based or other materials, such as audio- or video-based resources that can also be used together with a textbook or other paper-based materials. Of course, mobile technologies can be used to support other activities through other devices like computers which have larger screens and keyboards that are easier for reading or typing, by acting as a resource such as a dictionary, reference tool, communication device, or an audio or video player. In this way, MALL is becoming a multimodal, multiplatform experience where the learner is interacting with multiple technological and non-technological options as a larger part of their learning experience.

1.3 Understanding MALL

Four years after the release of the first smartphones in 2007 (the LG Prada was followed by the iPhone in the same year), Traxler (2011) perceptively described mobile devices as "curiously both pervasive and ubiquitous, both conspicuous and unobtrusive, both noteworthy and taken-for-granted in the lives of most people" (p. 25). Although it has been more than a decade since this statement was made, it has become even more relevant now than it was when smartphones were just starting to find their place into our everyday lives. As educational applications of MALL increase, we are starting to see that these conflicting views still exist, and even though the mobile devices themselves are becoming more ubiquitous, there is both resistance and scepticism with regards to how they can be used effectively. The impact of technology is indeed unobtrusive in that we use devices these days with little thought of picking them up to find information or to communicate with others, but when educational purposes become the target, then there must necessarily be some degree of thought that goes into deciding what to use and how to go about doing it in order to achieve some learning outcome. For self-directed learning purposes, it may include making decisions about what app to use and how to use it (see Chapter 7), but even if tools have been assigned to learners, they are still faced with decisions and dilemmas about how, when, and where – and even why – they should use it, and how this fits into their daily or weekly schedule of private and educational uses of their mobile devices.

The impression that one often gets when talking about MALL is that it is viewed as being some kind of constant, as though MALL can be considered as a single teaching approach. As is described in Chapter 2, MALL is seen largely as being for self-study through apps, which does not take into account the complexities of what can be done through mobile devices based on the enormous range of technical functions that are now available. MALL can range from being a means for searching for information through a search engine on a mobile phone (Gu, 2016) or as an electronic dictionary (Levy & Steel, 2015) to using a dedicated vocabulary app like Quizlet (Tran, 2018), QR codes to promote interaction between students in class (Rivers, 2009), recording videos to develop presentation skills (Toland, Mills & Kohyama, 2016), to name a few. This small sample of the types of studies that can be carried out using mobile phones gives some insight into the complexities involved and the difficulties in referring to mobile learning as any kind of homogeneous type of learning. Surveys that ask learners about their attitudes towards so-called mobile learning have little to no meaning if

there is not some kind of supplementary information that can clarify *what* activities, as it is likely that most learners will possess very different attitudes towards different types of activities and tasks. MALL is a constantly evolving mixture of factors that capitalise on the various affordances inherent to each device and the new hardware and software that are developed over time. As a result, MALL refers to something that is fluid, and it is next to impossible to encapsulate it in a single term. In this way, when MALL is used in this book, it is describing a broad spectrum of activities and tasks that are tailored to different technologies, abilities, and contexts.

In understanding what MALL is, it also is helpful to consider also what it is not. As touched upon before, MALL is more than just a means for learners to engage in individual self-study, although it is often viewed that way by many who are contemplating using mobile technologies as a part of their teaching and learning environments. In one sense, this perspective is an example of a parallel that exists between CALL and MALL. Just as CALL often conjures images of self-study in front of a computer, MALL is envisaged as being predominantly dedicated language learning apps. In one sense, the image of mobile learning as equating with apps is probably not that surprising, given that apps are one of the most visible aspects of our current mobile devices. It is true that pretty much everything that happens through mobile devices is indeed done through apps, such as launching web browsers, social media, office tools, music, and even cameras. As described before, however, MALL is far more than this, and using mobile technologies opens up a whole world of interactive and social possibilities that can enrich the learning process qualitatively and quantitatively.

I would argue that MALL is not *fundamentally* different from CALL. There are some who might disagree with this statement, but thinking through what MALL is can help to make sense of this perspective. As with CALL, the ultimate aim of using technologies is to enhance the various language skills (namely, writing, listening, and speaking) and language areas (such as vocabulary, grammar, pronunciation, fluency, and so forth) that go into making a person into a proficient user of a language. The similarities lie not only in the ultimate aims of teaching and learning a language but also with the expectations for their impact on the learning process and the fact that they allow for instant access to a range of multimodal learning materials, social communities, and immediate and personalised feedback. As described earlier, they have also been through a similar path of evolution that makes them the target of comparisons with other methods, as will be described further in Chapter 4.

There are, however, a number of considerations that do need to be kept in mind in order to understand how to make the most of mobile technologies from the perspectives of both teaching and research. Firstly, the *affordances* of mobile devices need to be considered. Put simply, the term affordances is used to connote what something makes possible (see Norman, 2013) and is often used to refer to the technical functionality of the device, but it can also include environmental factors and the perceptions of how the device will be used (see Chapter 2 for a discussion). There are naturally going to be differences in the affordances of mobile devices from various other technologies such as computers (and, of course, variations between different mobile devices as well), so understanding the impact of these affordances can contribute to understanding what device or devices are most suited to a particular environment. Secondly, realising that mobile learning in recent years has relied heavily on people using their own devices means that there is a need to be aware of the differences between what learners will be carrying with them in terms of both hardware and software. This has, of course, happened with CALL to some degree now too, with many institutions opting to reduce self-access computer laboratories to cut maintenance and running costs as more students carry their own laptops, but many institutions still opt to keep computer rooms for class learning. Thirdly, tracking what learners do with mobile devices both inside and outside of the classroom is rather more difficult when learners are using their own devices. Computers in classrooms may have tracking software installed for research or learning purposes, but it becomes decidedly more difficult to track usage with learners' personal mobile devices. Finally, using mobile devices for assessment can be a challenge, particularly in classroom situations. A mobile may be used as a "replacement" for the computer in carrying out some activities, but their use in some forms of assessment may be difficult. The teacher may be able to keep a watchful eye on learners' interactions with computers either directly or through computer lab management software, but mobile devices may require a more vigilant approach. In saying this, ways of preventing cheating through mobile devices are also starting to emerge. The issues of using the tracking and assessment with mobile devices will be dealt with in more detail in Chapter 8, but there are obviously underlying issues regarding how learners use their devices that also need consideration. Tracking does make it possible to see not only *when* but also *how* students are doing required tasks or homework outside of class. Server access logs can allow teachers to see learner behaviour in doing tasks or homework, but that has also made it possible to see that many learners simply complete tasks without considering the reasons for doing so (Fischer, 2012).

Looking at both the product *and* the process can reveal rather undesirable engagement patterns, often because learners are just not aware of the reasons for doing these tasks and activities, which makes the value in requiring them to do so in the first place somewhat questionable (Palardy, 1988; Wallinger, 2000). Thus, an unexpected outcome of the affordances of technology is it can provide a window into learner behaviour that can lead teachers to reconsider their practice.

A term that is often misunderstood is *ubiquitous learning*. Ubiquitous learning is often used interchangeably with the term mobile learning, but these two terms refer to overlapping but quite different concepts. Looking at the meaning of these two terms individually sheds light on the difference; mobile means something that is on the move whereas ubiquitous means that something exists everywhere. Mobile learning, then, is most commonly used to refer to using mobile devices to engage in learning on the move, but as described earlier, it is also used to encompass using mobile devices in fixed locations as well. In contrast, ubiquitous learning means having access to learning technologies in whatever location the learner might be in, and this may include a combination of both mobile and non-mobile devices. In ubiquitous learning, the learner can use multiple devices that share data and information seamlessly between them, such as may be seen with cloud computing, while mobile learning is most commonly carried out on devices that are carried by the learner, which may or may not access this shared data or information. In this sense, mobile learning might be considered as a part – albeit an important one – of ubiquitous learning, where it makes up the range of tools that are available for the learner to remain connected to the learning environment. Where there may be limitations caused by the affordances of a mobile device, they can be compensated for by using other technologies, and at the same time, learners may be able to pick up where they left off using a less-mobile technology such as a desktop or laptop computer to continue engaging with learning content or others. It is evident that the affordances of mobile devices make it impractical to be the only electronic device to be used language learning in terms of screen size, text input, storage, and battery issues (Stockwell, 2016), so embedding mobile learning into the larger context where it complements other tools and devices would seem to be a preferable way to keep learners engaged in learning in various shapes and forms, which logically would point to the conclusion that MALL is an essential part of ubiquitous learning and vice versa.

The preceding discussion provides a very brief introduction to some of the key issues associated with mobile learning, gives some insights

into what mobile-assisted language learning is (and what it is not), and points out a number of key issues that will be discussed in more depth in later chapters. The remainder of this chapter provides an overview of each of the chapters in the book.

From the Field: Mobility in MALL

The image that is held of MALL, and indeed the main "selling point" of it, is that learners will take advantage of short moments in the middle of their busy schedule to engage in small snippets of learning (sometimes called "micro-learning" or "atomised learning," as described in Chapter 8). Theoretically, this is a wonderful concept – and one that is thought to be suited to learners with shrinking attention spans – but it is based on assumptions that do not seem to hold true as often as teachers might hope. In my experience, the reasons for this appear to be that when learners are in positions that might be considered as mobile (in transit or even in a café or other location that they temporarily occupy), the distractions inherent to such locations make it difficult to concentrate sufficiently on the tasks they are trying to engage in. The problems of returning one's attention to a learning activity after even just a few minutes away from it mean that there is inevitably going to be some lead-in time to prepare before any meaningful learning can take place. Looking at many of my own learners has shown that they also come to this realisation. Learners with longer commutes on public transport do, in fact, take advantage of this time, but for the most part, many learners seem to seek quieter locations where they can spend quality time on learning activities, even if they use their mobile devices. This does not necessarily mean that learners do not use the small snippets in time on occasion, but it seems that learners become aware of the limitations of trying to learn in short bursts and favour locations such as their own homes, where they can engage for longer periods without interruption.

1.4 Overview of the Book

Apart from this introductory chapter, there are eight chapters in this book, including the Conclusion – which brings together the various discussions raised throughout the book to address the title of this book, considering the concepts, the contexts, and challenges. Chapter 2 considers parallels between CALL and MALL and outlines how the technological affordances of various devices affects the ways in which they are used to achieve specific goals. It then describes the interrelationships among technology, research, practice, and theory. It outlines the evolution of mobile technologies and emphasises the

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importance of moving from affordance-based practice through to pedagogy-based practice as technologies move through the hype cycle (cf. Gartner, 2016). The issue of push and pull modes associated with mobile technologies is outlined here, along with the ability of mobile devices to interact with other devices through a range of networking functions, the potential for mixed reality learning and context sensitive learning, and the use of other functions such as cameras and audio recorders for language learning. The chapter continues by pointing out some of the limitations of research on technology use in language education and then considers some of the complexities of both theory and practice in MALL in order to lay the foundations for the later chapters.

The main thrust of Chapter 3 is to discuss how dramatically teaching and learning are changing, largely as a result of developments in technology. These changes have brought about shifts in the roles of the teachers, of learners, and even of the technologies themselves. Not only do teachers have to manage their teaching environments, but they also need to manage their technological skills and the emotional load that goes along with the pressures of maintaining digital literacy. Learners are faced with having greater expectations to use technology, while at the same time it is expected that they are already skilled in using technologies for learning purposes. It explores the possible future directions of education, where teachers and learners need to consider not only what information needs to be learned but also what information is acceptable to be referenced. They also need to develop skills in evaluating information from the enormous amount of available resources. The chapter also explores the view of teaching and learning in formal and informal contexts and looks at how mobile technologies have impacted both of these learning situations. It deals with the emerging concept of mobile literacy, outlining what learners should be aware of when engaging in learning and non-learning activities on their mobile devices. Finally, given that mobile devices are constantly "switched on" and generally carried almost constantly by learners, the chapter discusses the issue of motivating learners to take advantage of their devices to engage in activities that are associated with learning languages.

Research into MALL has proven to be somewhat complex when compared with much of the earlier research in the field of CALL, which is the focus of Chapter 4. The reasons for this are twofold. Firstly, by the nature of the device, there is an expectation that a significant proportion of learning through mobile devices will take place out of class. While this does not preclude using devices in classroom settings (and there have been several very interesting studies

that have looked at the use of mobile devices in class), it is exponentially more difficult to determine how learners are using their mobile devices in uncontrolled and unsupervised settings. Secondly, learners are typically using their own devices, although early studies into mobile devices typically involved using loaned PDAs or even iPads, whereas similar data for mobile devices owned by learners is not available because it is not logistically possible to install tracking software on them. Learner usage data then will need to take the form of data that can be stored on a central server or reported data, each of which face potential limitations. Thus, the purpose of this chapter is to outline the difficulties involved with undertaking research in MALL as well as describing various innovative approaches that have been undertaken, illustrated through appropriate recent examples from the literature.

Chapter 5 deals with theory in MALL. Discussions of the role of theory in CALL have been rather limited to date and have typically relied heavily on second-language acquisition (SLA) theories or other theories related to learning and pedagogy. This in itself is not particularly surprising or inappropriate, but there has been very little discussion of the role of technology in the learning process. The majority of the work that considers theory relating to technology to date has revolved around the multimodality that modern technologies make possible. This has included looking at the cognitive load associated with each mode and how access to information through different channels can facilitate learning. These aspects are equally relevant in MALL, but there are added elements with using mobile devices that must also be taken into consideration. These include the way in which technologies can be used as an ongoing reference tool, where users can look up information quickly and easily rather than committing them to memory. These aspects were also relevant to a far lesser degree through non-mobile devices, but the more frequent the access we have to mobile technologies, the more likely we are to pick them up to seek out information rather than attempting to retrieve information already stored in our memories. This has an impact not only on theories of learning but most certainly on theories of pedagogy.

Chapter 6 explores the physical, psychosocial, and pedagogical issues associated with MALL. The physical characteristics of mobile devices such as the size of the screen and the input methods have long been an issue when considering their applicability for learning, but these have often been considered as a necessary trade-off in order to maintain their portability. In addition to this, however, there are also psychosocial issues considering the position of mobile devices in the minds of the learners and teachers, such as a personal tool for private

uses or a tool that can be applied to any use as required. This perception of mobile devices is often a product of the social context in which they are used, and this will likely vary depending on the region, the socioeconomic status, and the age group of the users. Furthermore, the dangers in distractions both inside and outside of the device are described here along the psychological impact of mobile devices on learners' abilities to concentrate on multiple tasks. Finally, the chapter discusses the issue of pedagogy when learning through mobile devices and the factors that may be thought to contribute to successfully achieving learning goals and sustaining task engagement. The details of research studies that look at the impact of each of these elements are described.

The ultimate user of MALL is the learner, which is the main focus of Chapter 7. Learner agency is an issue that helps us to gain a better understanding of how and why learners are or are not able to make appropriate choices applicable to their learning. Agency may be related to individual characteristics of the learner, but it may also be supported by proxy or collective agency from the teacher or larger environment. Even learners who exhibit agency experience difficulties in making appropriate choices about their learning, which is why learner training is essential. In MALL, learner training is key in ensuring that learners understand the reasons for engaging in mobile activities as well as what is expected of them from teachers. Stockwell and Hubbard (2014, 2015) provided evidence that ongoing training in technological, strategic, and pedagogical aspects can have a very powerful effect on the ways in which learners view mobile and engage in learning activities, Thus, the chapter argues for ongoing training that guides learners to develop autonomy through evaluation of the strategies they employ and sharing their learning experience with others to help them reflect on their learning.

Chapter 8 explores the concept of design in MALL. Design can take place at multiple levels, starting with the larger learning environment, through to the digital artefacts that are used by learners and the design of tasks for using the artefacts within the given environment. Some of the key models of general design of the learning environment, artefacts, and tasks are provided with examples of how they relate directly to MALL. The complexities of designing assessment are also discussed. The chapter concludes with basic guidelines to bear in mind when designing a MALL and outlines a list of principles for the successful implementation of mobile devices in language teaching and learning contexts.

Finally, Chapter 9 brings together the arguments covered in the previous eight chapters and returns to the title of the book: concepts,

contexts, and challenges. The concepts that need to be kept in mind for the future of mobile learning are explored, along with the impact of the context on language teaching and learning through mobile technologies. Along with these, the current and prospective challenges are also investigated, with a view to seeing how these challenges can be overcome to make the most of what MALL can be. The potential future directions in which mobile learning may be considered to evolve will also be discussed here, not in terms of evolving technologies, but ways that the field seems to be headed and how these can relate to meaningful research and practice that is needed in both the short and longer term.

There are an enormous number of issues associated with mobile learning that could have been covered in this book, and while I have attempted to give attention to what I consider to be the main issues, there are obviously other issues that are emerging at the time of writing and different viewpoints and perspectives that others may feel strongly about from their own individual experiences. Mobile-assisted language learning varies in so many ways, depending on the attitudes, skills, and preferences of learners, teachers, administrators, and other stakeholders in the learning context to the various technologies that may be used, the networking environment, availability of resources, the language being studied, social expectations, and the list continues. This diversity contributes to the ever-changing nature of the field and has also brought about some extremely creative and even ingenious uses of different mobile technologies. It is hoped that this book will spark an interest in what mobile-assisted language learning can be while, at the same time, allowing potential adopters of mobile technologies to embark on their journey with their eyes open to the benefits and dangers that might be associated with MALL. It is becoming quite undeniable that mobile-assisted language learning will be a part of most language learning environments in some shape or form as time goes by, so having an idea of what has been done and what we still need to investigate further can help to lead towards meaningful research and practice.

1.5 Discussion Questions

1. Do you see the digital divide as being problematic within your own teaching or learning context? Why or why not? If so, how might this be dealt with specifically in your context?
2. How would describe what MALL is in a sentence? How would you respond to questions about the best apps for language learning?

3. In what way would you see MALL as being different from CALL? Do you think that this difference is important? Why or why not?
4. What would you include in a list of devices that would be appropriate for MALL? Give a rationale for each of these. Are there any mobile devices that you would not include? Why?